



# WOC-304X\_306X\_308X

Photo Coupler

## Description

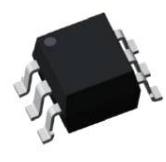
The WOC-304X\_306X\_308X series of devices each consist of a GaAs infrared emitting diode optically coupled to a monolithic silicon zero voltage crossing photo triac. They are designed for use with a discrete power triac in the interface of logic systems, such as solid-state relays, industrial controls, motors, solenoids and consumer appliances.



DIP6



DIP6-M



DIP6-S1

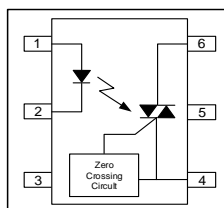
## Features

- High input-output isolation voltage (Viso = 5,000Vrms)
- High repetitive peak off-state voltage VDRM.
- WOC-304X: Min. 400V; WOC-306X: Min. 600V; WOC-308X: Min. 800V;
- High critical rate of rise of off-state voltage (dv/dt : MIN. 1000V /s )
- Operating Temperature: -40°C ~ 110°C
- Safety approval
- RoHS
- MSL1

## Applications

- Solenoid/valve controls
- Static power switch
- AC motor drivers
- Temperature Control

## Schematic & PIN Configuration



Pin Configuration

1. Anode
2. Cathode
3. No Connection
4. Terminal
5. Substrate (do not connect)
6. Terminal

Order Code

WOC - 30XX - X X - X X - XX

①    ②    ③    ④    ⑤

Designation:

WOC = WAYON Optocoupler

30XX= Product Series (304X/306X/308X , X:1/2/3)

- ① = Lead form option(S1,M,NONE) <sup>(1)</sup>
- ② = Tape and Reel option(TA,TA1,NONE) <sup>(2)</sup>
- ③ = VDE order option(fixed code "V")
- ④ = Halogen free option(fixed code"G")
- ⑤ = Customer code

Notes

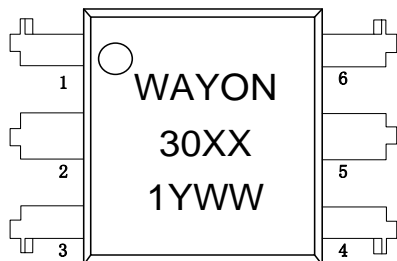
1. Lead form option:

Symbol	Description
S1	DIP6-S1
M	DIP6-M
NONE	DIP6 Normal

2. Tape and Reel option:

Symbol	Description
TA&TA1	Tape and Reel Type
NONE	DIP Type

Marking Information



Designation:

- WAYON: denotes WAYON
- "30XX"denotes Device
- "1Y"denotes year code
- "WW" denotes week code

## Maximum Ratings

Parameter		Symbol	Value	Unit
Input	Forward Current	$I_F$	50	mA
	Reverse Voltage	$V_R$	6	V
	Power Dissipation	$P$	120	mW
	Junction Temperature	$T_J$	125	°C
Output	Off-State Output Terminal Voltage	WOC-304X	400	V
		WOC-306X	600	
		WOC-308X	800	
	Peak Repetitive Surge Current (PW=1ms,120 pps)	$I_{TSM}$	1	A
	On-State RMS Current	$I_{T(RMS)}$	100	mA
	Junction Temperature	$T_J$	125	°C
Collector Power Dissipation	$P_C$	150	mW	
Operating temperature range		$T_{opr}$	-40 ~ 110	°C
Storage temperature range		$T_{stg}$	-55 ~ 125	°C
Total Power consumption		$P(W)$	250	mW
Isolation Voltage <sup>(1)</sup>		$V_{ISO}$	5000	V <sub>rms</sub>
Soldering Temperature <sup>(2)</sup>		$T_{SOL}$	260	°C

Notes:

(1). AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1, 2 are shorted together, and pins 3, 4 are shorted together.

(2).For 10 seconds

Electrical Optical Characteristics ( $T_a=25^{\circ}\text{C}$ )

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Input	Forward Voltage	$V_F$	$I_F = 20\text{mA}$	-	1.2	1.4	V	
	Reverse Current	$V_R$	$V_R=6\text{V}$	-		5	$\mu\text{A}$	
Output	Peak Blocking Current, Either Direction <sup>(1)</sup>	$I_{DRM}$	$V_{DRM}=\text{Rated } V_{DRM}$	-	-	500	nA	
	Peak On-State Voltage, Either Direction	$V_{TM}$	$I_{TM}=100\text{mA Peak}$	-	-	3	V	
	Critical rate of Rise of Off-State Voltage <sup>(2)</sup>	dv/dt	$V_{in}=240\text{Vrms}$	1000	-	-	V/ $\mu\text{s}$	
Couple	Led Trigger Current, Current Required to Latch Output, Either Direction	WOC-3041 WOC-3061 WOC-3081	$I_{FT}$	Main Terminal Voltage = 3V	-	-	15	mA
		WOC-3042 WOC-3062 WOC-3082			-	-	10	
		WOC-3043 WOC-3063 WOC-3083			-	-	5	
	Holding Current, Either Direction	$I_H$	-	-	400	-	$\mu\text{A}$	
ZERO CROSSING	Inhibit Voltage	$V_{INH}$	$I_F=\text{Rated } I_{FT}, \text{MT1-MT2 Voltage above which device will not trigger.}$	-	5	20	Volts	
	Leakage in Inhibited State	$I_{DRM2}$	$I_F= \text{Rated } I_{FT}, \text{ Rated } V_{DRM}, \text{Off State}$	-	-	500	$\mu\text{A}$	

Note\*:

(1) Test voltage must be applied within dv/dt rating.

(2) This is static dv/dt. Commutating dv/dt is a function of the load-driving thyristor(s) only.

# Typical Characteristics

Fig.1 Forward current vs.Ambient temperature

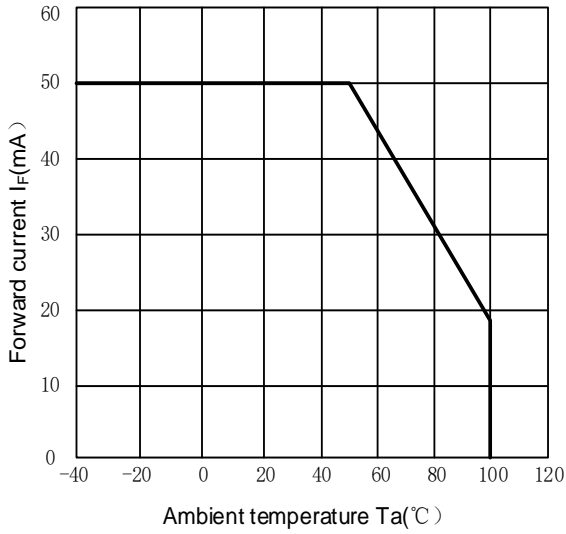


Fig.2 On-state current vs.Ambient temperature

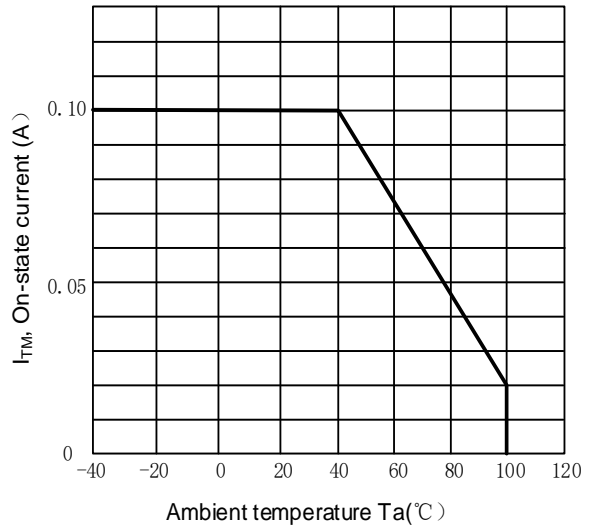


Fig.3 Minimum Trigger Current vs Ambient temperature

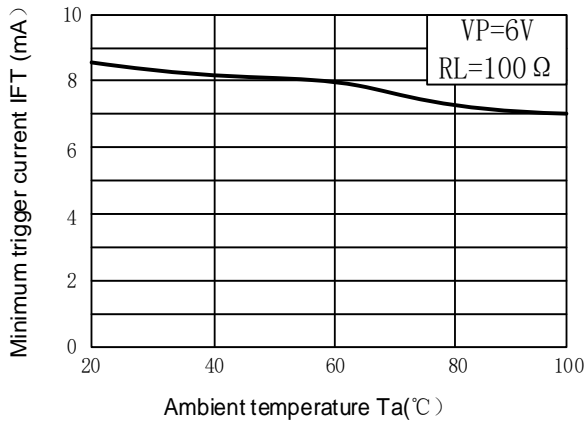


Fig.4 Forward current vs Forward Voltage

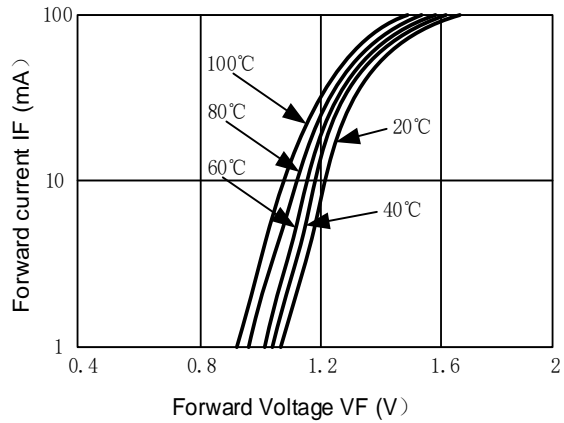


Fig.5 On-state voltage vs Ambient temperature

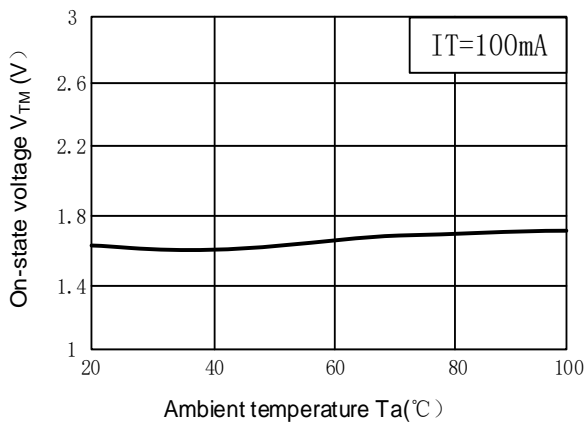


Fig.6 Holding current vs Ambient temperature

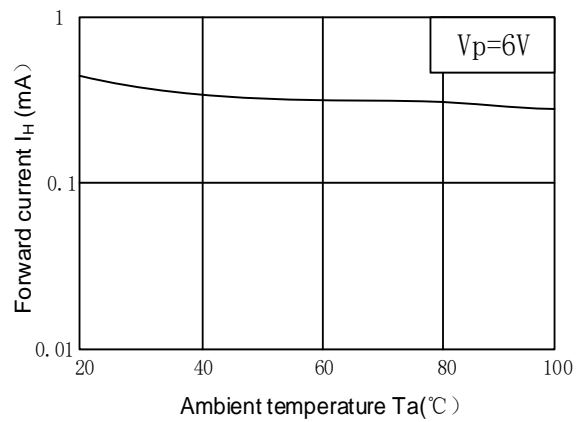


Fig.7 Repetitive peak off-state current vs Temperature

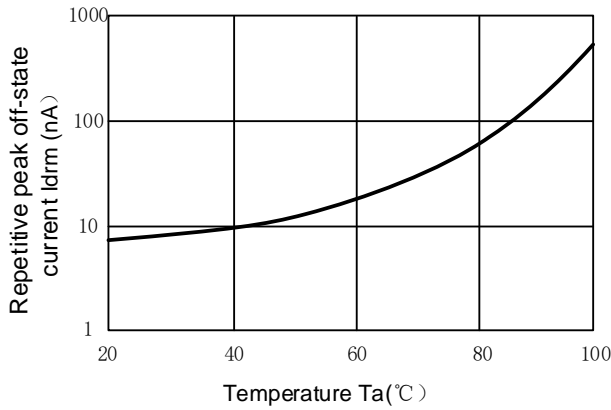


Fig.8 On-state current vs On-state voltage

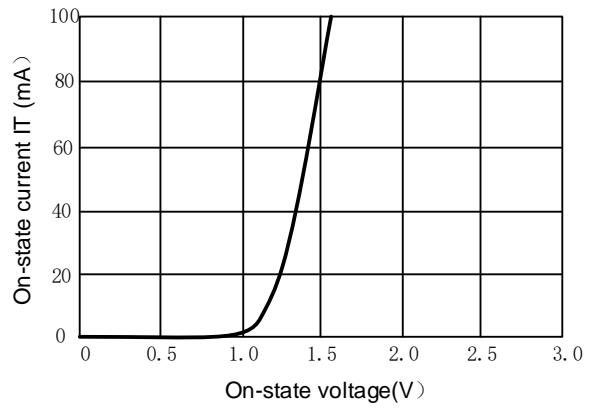


Fig.9 Basic Operation Circuit Medium/High Power Triac Drive Circuit

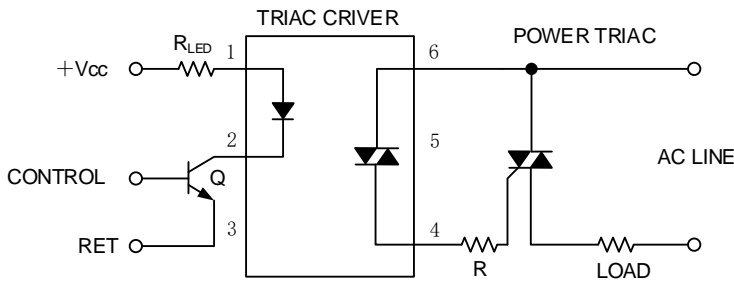
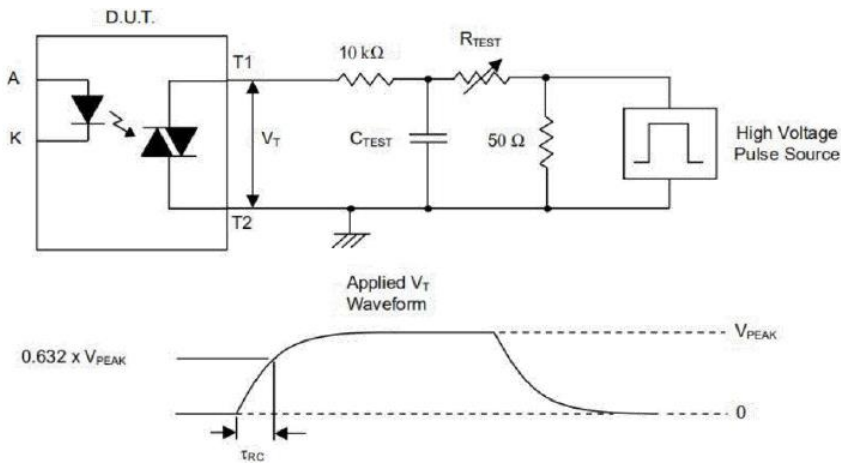
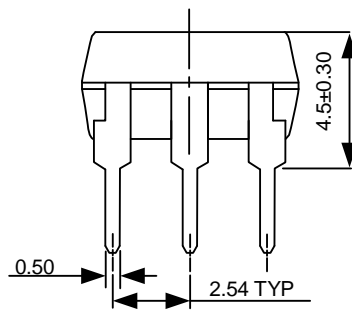
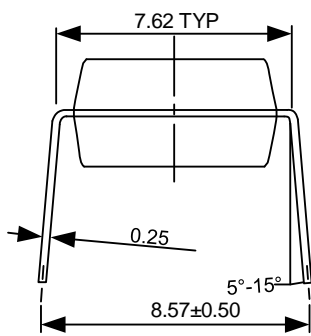
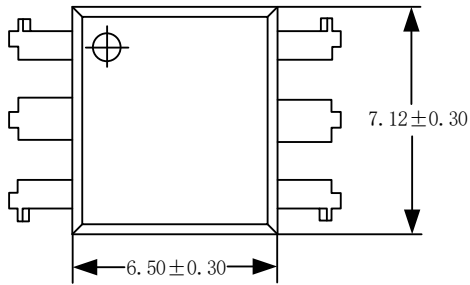


Fig.10 Static dv/dt Test Circuit & Waveform

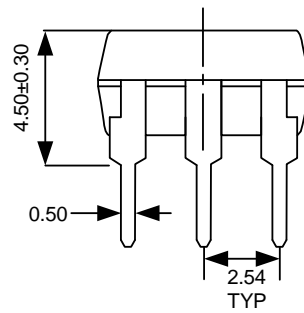
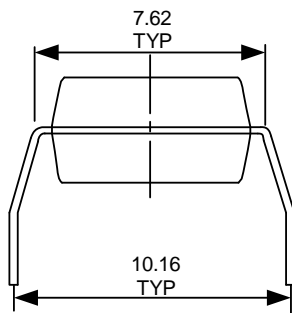
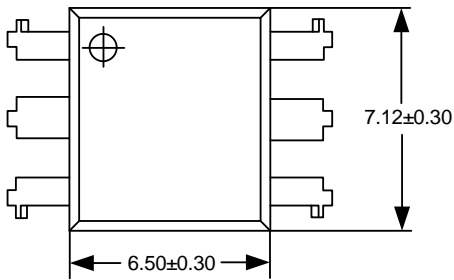


### Outline Dimensions

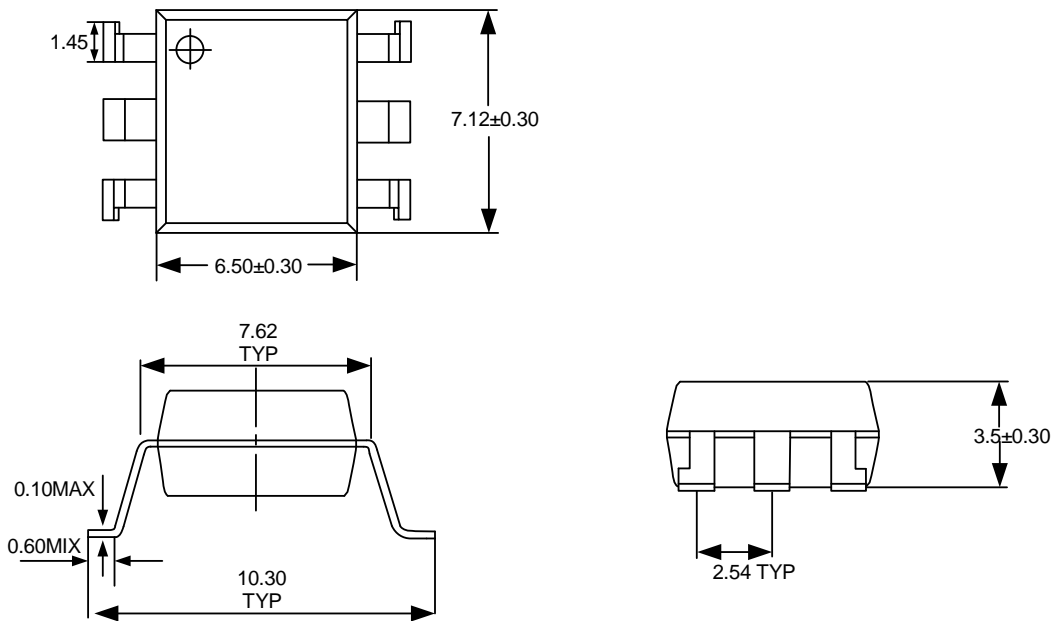
DIP Normal Type:



DIP M Type:



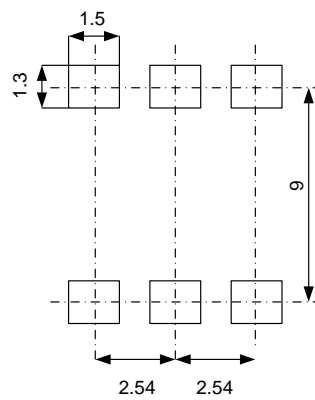
DIP S1 Type:



Unit: mm

Tolerance:  $\pm 0.1$ mm

### Recommended Pad Layout



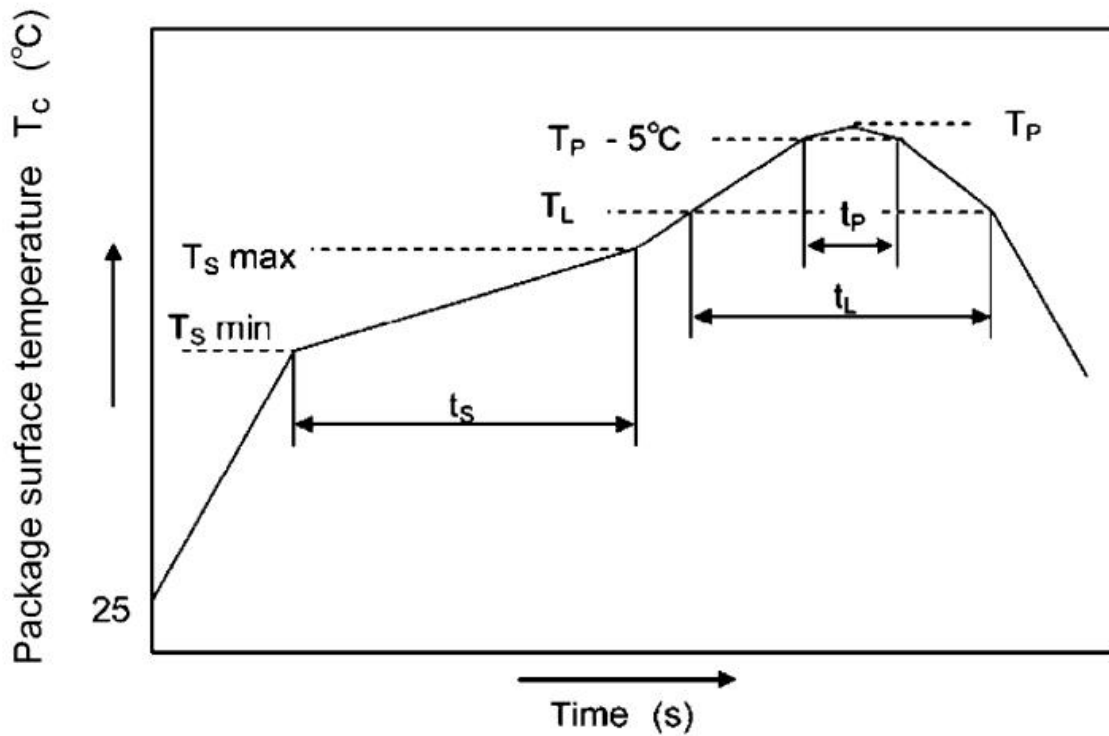
Unit: mm

Tolerance:  $\pm 0.1$ mm



## Temperature Profile Of Soldering

### 1. IR Reflow soldering(JEDEC-STD-020D compliant)



Item	Symbol	Min.	Max.	Unit
Preheat Temperature	$T_s$	150	200	°C
Preheat Time	$t_s$	60	120	s
Ramp-Up Rate ( $T_L$ to $T_P$ )	-	-	3	°C /s
Liquidus Temperature	$T_L$	217		°C
Time Above $T_L$	$t_L$	60	150	s
Peak Temperature	$T_P$	-	260	°C
Time During Which $T_c$ Is Between ( $T_P-5$ ) and $T_P$	$t_p$	-	30	s
Ramp-down Rate( $T_P$ to $T_L$ )	-	3	6	°C /s

Note:

One time soldering reflow is recommended within the condition of temperature and time profile shown below. Do not solder more than three times.

## 2. Wave Soldering(JEDEC22A111 compliant)

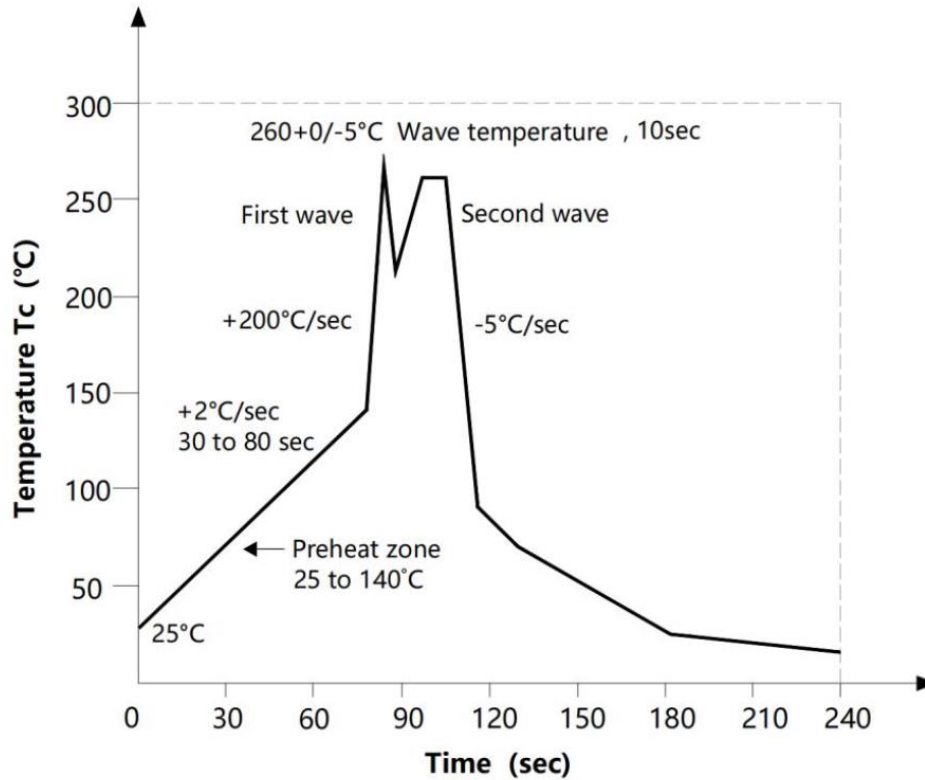
One time soldering is recommended within the condition.

Temperature:  $260 \pm 5^\circ\text{C}$ .

Time: 10 sec.

Preheat temperature: 25 to  $140^\circ\text{C}$ .

Preheat time: 30 to 80 sec.



## 3. Hand soldering by soldering iron

Allow single lead soldering in every single process. One time soldering is recommended.

Temperature:  $380 \pm 5^\circ\text{C}$

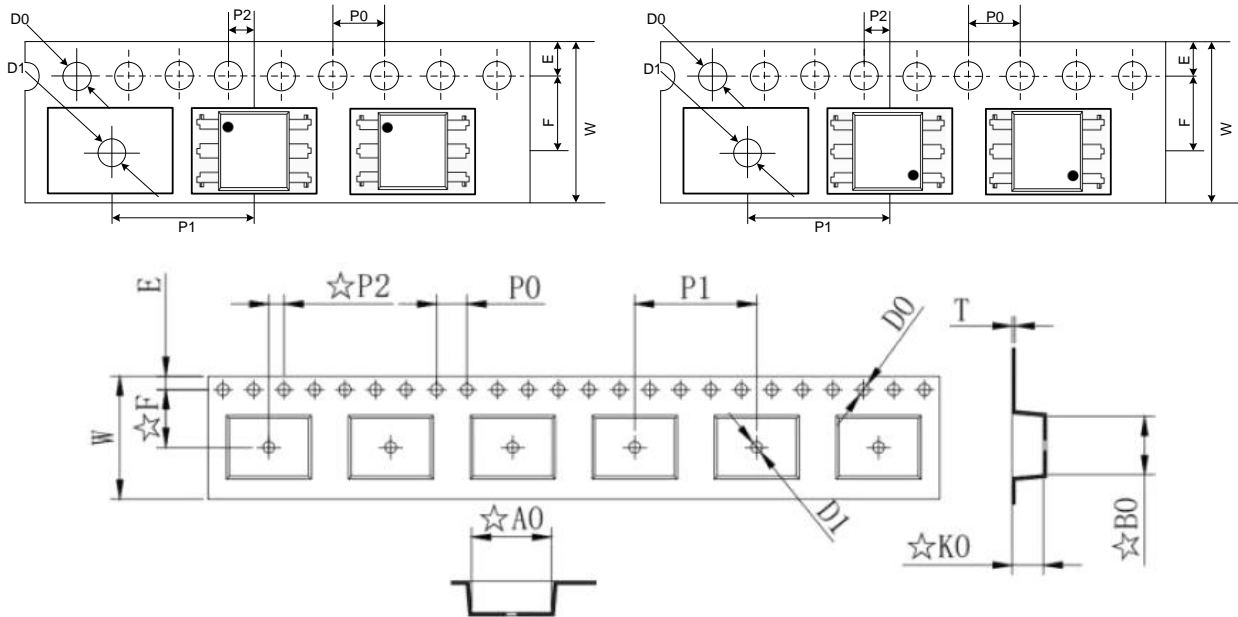
Time: 3 sec max

**Packing**

Tape & Reel

**OptionTA1:**

**Option TA:**



Deminsion/mm	W	E	F	P0	P1	P2
Package type:S	16±0.2	1.75±0.1	7.5±0.1	4±0.1	16±0.1	2±0.1

Deminsion/mm	A0	B0	D0	D1	K0
Package type:S	10.45±0.1	7.6±0.1	1.5±0.1	1.5±0.1	4.1±0.1

Unit: mm

**1. Reel**

Packagetype:S	Reel	Inner carton	Outer carton
QTY/PCS	1K/reel	2K(2 reels)	20K

**2. Tape and Tube**

Package type:Normal&M	Tube	Outer carton
QTY/PCS	65	3.25K(50 tubes)

**CONTACT INFORMATION**

No.1001, Shiwan (7) Road, Pudong District, Shanghai, P.R.China.201207

Tel: 86-21-68969993 Fax: 86-21-50757680 Email: [market@way-on.com](mailto:market@way-on.com)

WAYON website: <http://www.way-on.com>

For additional information, please contact your local Sales Representative.

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### Product Specification Statement

1. The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.
2. The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. WAYON shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and WAYON assumes no responsibility for the application of the product.
3. WAYON strives to provide accurate and up-to-date information to the best of our ability. However, due to technical, human, or other reasons, WAYON cannot guarantee that the information provided in the product specification is entirely accurate and error-free. WAYON shall not be held responsible for any losses or damages resulting from the use or reliance on any information in these product specifications. WAYON reserves the right to revise or update the product specification and the products at any time without prior notice, and the user's continued use of the product specification is considered an acceptance of these revisions and updates. Prior to purchasing and using the product, users should verify the above information with WAYON to ensure that the product specification is the most current, effective, and complete. If users are particularly concerned about product parameters, please consult WAYON in detail or request relevant product test reports. Any data not explicitly mentioned in the product specification shall be subject to separate agreement.
4. Users are advised to pay attention to the parameter limit values specified in the product specification and maintain a certain margin in design or application to ensure that the product does not exceed the parameter limit values defined in the product specification. This precaution should be taken to avoid exceeding one or more of the limit values, which may result in permanent irreversible damage to the product, ultimately affecting the quality and reliability of the system or equipment.
5. The design of the product is intended to meet civilian needs and is not guaranteed for use in harsh environments or precision equipment. It is not recommended for use in systems or equipment such as medical devices, aircraft, nuclear power, and similar systems, where failures in these systems or equipment could reasonably be expected to result in personal injury. WAYON shall assume no responsibility for any consequences resulting from such usage.
6. Users should also comply with relevant laws, regulations, policies, and standards when using the product specification. Users are responsible for the risks and liabilities arising from the use of the product specification and must ensure that it is not used for illegal purposes. Additionally, users should respect the intellectual property rights related to the product specification and refrain from infringing upon any third-party legal rights. WAYON shall assume no responsibility for any disputes or controversies arising from the above-mentioned issues in any form.